Space Weather Forecast

Issued on Sunday, 30 June 2024 at 13:10 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares throughout. Chance of G1/Minor Storm intervals Day 1 (30 Jun) and again Days 3-4 (02-03 Jul).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: There are currently fifteen regions on the disc, most of which are small and simple. The largest region remains in the southwest quadrant, followed by one approaching south centre disc and another in the southeastern quadrant. Two of these seem to be mature and largely inactive. The region in the southeast has seen growth of its intermediate spots, with a further region to the north of this showing growth of the trailing penumbra, but losing some intermediate spots. A region which has recently rotated onto the eastern limb, is starting to show some intermediate spots and may continue to alter as it becomes more clearly visible. There appears to be magnetic interaction between many of these regions, especially those close together in the south of the disc.

A large filament (arc of plasma held above the Sun's surface by magnetic fields) in the southwest was observed lifting off around 29/1530 UTC, with a subsequent Coronal Mass Ejection (CME) observed in satellite imagery. Analysis suggests this could give a glancing blow at Earth on Days 3 or 4 (02-03 Jul).

Solar Wind / Geomagnetic Activity: Solar winds are still showing weak CME effects after the arrival on 28 Jun. Wind speeds have been slightly elevated, between 380-500 km/s, but with a slight rising trend recently. The Interplanetary Magnetic Field was initially moderate, but has eased to become weak. The north-south component has varied throughout the period, occasionally moderately. Geomagnetic activity has been Quiet to Unsettled (Kp2-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has remained at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is likely to continue, with a chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: Effects from the CME that arrived at Earth on 28/0910 UTC have continued to wane. However, there is the potential for a further weak CME arrival on Day 1 (30 Jun). A large CME was observed in the southwest, lifting off around 29/1530 UTC, with a glancing blow likely either on Day 3 or Day 4 (02-03 Jul). There are significant uncertainties in the timing of both features, however. There are no significant coronal holes on the disc to give any fast wind influence.

Geomagnetic activity is expected to be generally Quiet to Unsettled (Kp1-3), with a chance of Active to G1/Minor storm intervals (Kp4-5) on Day 1 and again on Days 3-4 under CME influence, however confidence is fairly low.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels, but with a very slight chance of exceeding the S1/Minor Storm threshold should any notable flares occur from the numerous sunspots that currently occupy the visible disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	5	30	30
Strong	G3	No	1	1	5	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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